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ABSTRACT

This document describes the implementation of a practicum intervention designed to improve the analytic abilities of academically above-average fifth and sixth graders in a class that emphasized academic excellence. When students were tested on the development of complex thinking abilities, several areas needing improvement were identified. A target group of 10 students who were weak in analytic skills was selected to facilitate program monitoring. The 10-week intervention consisted of: (1) daily 15-20 minute lessons with language arts or mathematics tasks geared to increase analytical skills; (2) daily homework activities; (3) weekly lessons in language arts, mathematics, and social studies that involved thinking and problem solving; and (4) a 3-week-long individual research project that students completed at home. Daily tasks were drawn from books that provided problems for students to solve by using mathematics or language skills. Students were evaluated on the criteria of concentration, effectiveness, and analysis. Students found to be deficient in analytic skills at the beginning of the school year were not deficient when retested at the end of the school year. All students in the class, whether or not they were in the target group, showed substantial gains in analytical problem solving. (RH)

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IMPROVING THE SKILL OF ANALYSIS IN FIFTH AND SIXTH GRADE ACADEMIC EXCELLENCE STUDENTS

by

SANDRA STEIN

A Practicum Report
submitted to the faculty of the Center for the Advancement of Education of Nova University in partial fulfillment of the requirements for the degree of Master of Science in Elementary Education

ANALYSIS SKILLS

MAY/1986

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I hereby testify that this paper and the work it reports are entirely my own. Where it has been necessary to draw from the work of others, published or unpublished, I have acknowledged such work in accordance with accepted scholarly and editorial practice. I give this testimony freely, out of respect for the scholarship of other workers in the field and in the hope that my own work, presented here, will earn similar respect.

Sandra Stein

Sandra Stein

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ABSTRACT

Improving the Skill of Analysis in Fifth and Sixth Grade Academic Excellence Students.
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Descriptors: Elementary Education/Intermediate Grades/Grade 5/Grade 6/Gifted/Academically Gifted/Gifted Students/ Gifted Children/ Academic Excellence/ Cognitive Development/ Cognitive Ability/ Abstract Reasoning/ Cognitive Measurement/ Cognitive Objectives/Blooms Taxonomy/ Problem Solving/ Productive Thinking/ Creative Thinking/ Logical Thinking/ Concept Formation.

The writer initiated and implemented a program designed to increase the higher cognitive skill of analysis in fifth and sixth grade Academic Excellence students. This was to be achieved by an eclectic approach involving language arts, mathematics, and social studies. The program employed daily and weekly lessons, as well as a three week research project.

The primary objective was improvement of scores on the "Ross Test of Higher Cognitive Skills" as evidenced by percentile upgrades on spring testing as compared to fall testing. Assessment was done on a weekly basis through oral and written evaluation in the form of anecdotal records, checklists and numerical evaluation forms.

Spring test results and the correlation of checklists and evaluation forms indicated ~~tremendous~~ substantial gains by students falling in the deficiency category (below the 30th percentile) during fall testing. These students all tested non-deficient in the spring. Average gains were evidenced by students in the 31st to 50th percentiles and 51st to 75th percentiles. All students, both in and out of the target group, showed substantial gains in analytical problem-solving. (Appendices include demographics of the school population, tabulations of both Fall and spring test percentages, target group statistics and percentiles, a personal activity checklist, a lesson evaluation form, and target group lesson scores).

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PURPOSE

The educational setting for this action was that of a public elementary school in a large metropolitan area in the southeastern United States. The kindergarten through sixth grade population of the school was housed on a large campus consisting of two buildings which included a daily pre-school program, as well as a day and evening community school sharing the same facility. The student enrollment was approximately 1,600 students making it the largest elementary school in the county. A majority of the school population, 83%, was of Hispanic heritage. The remainder of the school was a white (7%) multi-ethnic group and a black population of approximately 10% which included a Haitian population of 3% (see Appendix A.) The local area was primarily socio-economically middle-lower class to lower-middle class so that most students were on a free lunch program indicative of a low income. The school population consisted mostly of recent (one to five years) immigrants. Many parents spoke only the native language at home.

The writer was a full-time teacher with responsibility for a combination 5th and 6th grade Academic Excellence class. A major purpose in the institution of this class was to bridge the gap from regular elementary school classes to honors classes. This was the second year of the program in this educational setting and the writer had been with this assignment since the inception of the class. The writer not only had had the prescribed county curriculum to follow, but with the aid of the administration, had been responsible for formulating a specific curriculum in each subject area covered. At

this writing, a mathematics and a science curriculum had been completed. Because of the nature of this assignment, the writer had virtually total control of the classroom structure and programming.

The class population was selected by the writer based on Stanford Achievement scores (see Appendix B), cumulative record comments, past report card grades, and teacher conference. Students who were unable to keep up with the pace, or who were unwilling to perform their work as needed, were placed back into a regular classroom setting. 1985-1986 found a class composed of approximately one-third of the students who were in last year's class, one-third who were in a trial Academic Excellence summer school class, and one-third who had entered the class only this past fall. The class was almost evenly divided between 5th and 6th grade, but had a larger population of female students than male students. Within the class there were four students who had qualified as gifted.

In an attempt to improve an understanding of the students' thinking to try to find ways to more rapidly "close the gap" mentioned above, the writer chose to administer the Ross Test of Higher Cognitive Process, an instrument specifically designed for use with both gifted and non-gifted students in the intermediate grades.

The Ross Test can be used in many ways in special programs, but was administered here to assess the level of critical thinking, inquiry methods, problem solving, logical thinking and, in general, to ascertain the students' development of complex thinking skills.

The test consisted of eight sections which tested the three highest cognitive processes according to Benjamin Bloom's Taxonomy

of Educational Objectives. These three processes were: analysis, synthesis and evaluation.

Upon administration of the instrument, there seemed to be several areas wherein the class experienced difficulty. To determine the areas needing improvement, the writer tabulated the test results in terms of percentages on the Fall tables of the test (the test was administered in November, 1985). Each student's results were tabulated in each category he/she had taken. Some students did not take every section of the test as it was administered in several sittings and they were not present at all sittings.

Each child's scores on all sections of the test were listed on a table with the percentages represented indicating those that the child had successfully negotiated. All fifth and sixth grade students were listed in columnar groups (see Appendix C). All students results were based on non-gifted standards except the four students who are considered gifted.

After tabulating the results of the testing, the writer selected a target group of students. It appeared to the writer that greater success in the program might be increased by investigating the areas which were less successfully negotiated in testing.

In order to select a group to monitor, the writer obtained the students' results from the county wide testing in the 1984-1985 school year. The county administered the Stanford Achievement Test, 7th Edition, in April, 1985.

The target group was selected based on their performance in the section of the Stanford labeled "Math Applications." This section was selected since it was the most abstract section of the test and the

skills at this level might be indicative of a student's higher cognitive skills. The writer decided to select a group slightly above the average or stanine 5. The selected group, ten children, all achieved scores in stanine 6. Their percentiles ranged from a low of 66 to a high of 75.

Although it was unintentional, the selected group consisted of five fifth graders and five sixth graders. There were six females and four males in the group. Three of the students were in last year's class, four were in the summer school class and three began in Academic Excellence in fall 1985 (see Appendix D).

After selecting the target group, the writer examined the results of the test to determine if this group had experienced any common areas of weakness. The writer tabulated (see Appendix E) and discovered that eight out of ten students had scored below the 75th percentile in three sections: Section II - Deductive Reasoning, Section III - Missing Premises, and Section VII - Analysis of Relevant and Irrelevant Information. According to the Manual of the test, Section II tested the process of evaluation while Sections III and VII both tested analysis.

The writer observed a problem area in the selected group related to their development in the cognitive process of analysis. The specific skills were: Analysis of Elements in Section III and Analysis of Relationships in Section VII. The writer tabulated in terms of two categories. The first category was a percentage less than 50%; the second category was a percentage of 51-75%.

In Section III, four students, three 5th graders and one 6th grader, scored below the 50th percentile, while four students, two

5th and two 6th graders scored between the 51st and 75th percentiles. On Section VII, six students scored below the 50th percentile. Of these, four were 5th graders and two were 6th graders. Two students, one at each grade level, scored between the 51st and 75th percentile on the same section.

John D. Ross, M.A. and Catherine M. Ross, M.Ed. producers of the test, state in the manual that "a percentile rank of 30 or below on any section of the test is generally considered to be deficient performance on the skill assessed by that section." Per this evaluation, three students were deficient on Section III, while four students were deficient on Section VII.

For the writer's purpose, and since the other areas of the test were handled more capably by the group, the writer decided to extend the evaluation up to the 50th and then to the 75th percentiles.

As an interesting corroborative note, following the administration of the test and the tabulation of the results with the above conclusion, the results of the 5th Grade State Assessment scores arrived indicating low performance in the areas of: identifying the order of events in a paragraph and, distinguishing between facts and opinions in a paragraph. These areas can be linked to the higher order processes and certainly further indicate an area needing improvement.

It was evident by examining the results of the Fall testing that there was a discrepancy between the target groups performance on Sections III and VII of the test in terms of low percentages. These students, who had scored well in other areas of their testing and above the mean in the "Math Applications" of the Stanford

Achievement test, should have been able to produce test scores that were not in the deficient range, and possibly above the 50th to 70th percentile.

The specific objectives designated to indicate achievement were the following:

1) Over a period of ten weeks, those students in the target group who scored below the 30th percentile on the Fall testing would achieve a non-deficient score on a re-administration of the testing instrument after the implementation of the practicum based on Spring 1986 percentiles.
2) Over a period of ten weeks, those students in the target group who scored between the 31st and the 50th percentiles on the Fall testing would achieve a score ten percentile points higher on a re-administration of the testing instrument after the implementation of the practicum based on Spring 1986 percentiles.
3) Over a period of ten weeks, those students in the target group who scored between the 51st and 75th percentiles on the Fall testing would achieve a score five percentile points higher on a re-administration of the testing instrument after the implementation of the practicum based on Spring 1986 percentiles.
4) Over a period of ten weeks, target students would demonstrate a more analytical problem-solving approach to their work as measured by teacher observation.

RESEARCH

In attempting to determine the cause or causes of the students' weak performance, the writer believed one reason was a lack of motivation. Letteri (1985) said "learning is not automatic..., it requires a sustained and conscious effort on the part of the individual". The student must be made aware of the need to put forth effort to succeed.

Another student difficulty was the approach taken to solve a problem. Whimbey (1984) suggested that the more precisely a student processes the information, the more accurately and completely he/she would comprehend relationships or situations.

It was possible that the cognitive style of the students had been or was, different than that of the teacher. Wallace and Gregory (1985) felt that a determination of whether a child was field-dependent or field-independent was helpful, as the teacher could then approach the student in the most effective way to help retention and retrieval of information. If this had not been considered in the past, these students might not have absorbed the necessary processing patterns.

A fourth problem might have been not having had enough exposure to problems involving analysis. Lipman (1984) purported that the basic repetoire of reasoning skills of the adult was relatively unchanged from that of the child. Therefore, the more developed the skill was in the earlier stages of life, the better the success later on.

Information specifically related to the improvement of the skill of analysis was very limited. The writer surveyed an expanded field of

relevant information which included critical thinking, reasoning, and problem-solving suggestions.

Many programs for teaching thinking, or thinking skills, had been formulated. The writer's investigation uncovered some programs based on a general thesis and others laid out in concrete steps.

Munro and Slater (1985) propose the teaching of critical thinking using a framework of traditional headings. They divided their headings into knowledge, skills/mental operations and affective learnings. Their plan was very specific.

Whimbey (1984) and his "precise processing" used regular course material to teach analytical reasoning.

Beyer (1985) stated in his article defining critical thinking that it was "unique because it involves careful, precise, persistent and objective analysis of any knowledge, claim or belief to judge its validity and/or worth." He listed ten skills that were important to this definition. In his second article using a direct approach (1985) he actually sets up teaching strategies to follow.

Zenke and Alexander (1984) used a program based on Albert Upton's "Design for Thinking" model. In Tulsa, the "Thinking Skills" program had six major components whereby "real life" and school performance were to be improved.

Another school district in Illinois was reported upon by Falkof and Moss (1984). This district concentrated on improving the teacher's ability to handle questioning techniques. They used Bloom's Taxonomy and Guilford's Structure of the Intellect to develop a four question structure; factual, interpretive, creative and evaluative.

One unusual and very modern approach was Pogrow's (1985) H.O.T.S. program. Higher order thinking skills were taught via the computer then transferred to the classroom.

Conversely, Lipman (1984) felt the age-old techniques of philosophy associated with the principles of logic were the best ways to teach thinking.

Sadler and Whimbey (1985) suggested a holistic approach which combined the teaching of analytical thinking with communication in order to improve a student's total intellectual functioning.

McFarland (1985) said that evaluation and analysis could readily be improved by using the strategies of "Word Associates" and "Defending a Point of View". She had strategies which include rules and criteria.

Grennon (1984) used the perspective of "cognitive levels matching" and stressed the teacher's recognition of the tie between the affective and cognitive domains.

Duck (1985) elucidated on the seven cardinal principles for teaching higher order thinking, but grouped the skills into a class he called "inquiry" skills. He discussed grading based on completeness, logic, and clarity of expression.

Nickerson (1984) provided a complete summary of programs proposed and grouped them into five categories: 1) cognitive process approaches, 2) heuristics-oriented approaches, 3) approaches that focus on the development of formal thinking in the Piagetian sense, 4) approaches that emphasize language and symbol manipulation and 5) approaches that focus on thinking as subject matter.

Joyce (1985) also summarized numerous methods for teaching thinking, but stressed the importance of staff development to insure success of a project.

Five principle goals of education were incorporated into Strong, Silver and Hanson's (1985) teaching strategies while the Bells (1985) insisted that only with writing synthesized to math can an effective method be found.

Sternberg (1985) believed we have substantial problems while teaching critical thinking, but felt that a possible solution was in giving the students training with real-life problems.

In the area of math, Sadowski (1985) investigated sentence-solving and saw that simplicity was sometimes the factor causing specific choice. Nicely (1985) surveyed math textbooks and found most to be lacking in teaching higher-order skills.

Analysis of reasoning abilities by Morante and Ulesky (1984) discussed the compilation of facts from state supervised instruments and how basic skills relate to "thinking".

Letteri (1985) used the Cognitive Profile Battery to assess his students. His work was very specific and dealt with the analytic area as one aspect. His work was a positive guideline to this writer's research. Letteri proposed that "only when the complexity of teaching reaches parity with the complexity of learning will significant improvement occur in classroom learning and performance for all students."

Research evidence, discussion with colleagues and administrators regarding their experiences, and the writer's professional judgment based on experience with the students in an academic excellence setting, suggested that an eclectic approach involving several subject areas concurrently appeared to be the best strategy for increasing the skill of analysis.

After careful consideration of various factors, the writer determined that utilizing the language arts, mathematics and social studies areas would reach the broadest spectrum of student needs.

All logistic components were carefully examined and incorporated into the strategy. The program could be reasonably accomplished in a ten week time period. The writer did not need to rearrange the daily schedule as all work was done either within the daily language arts, mathematics and social studies lessons or through the use of lesson extension in terms of homework assignments. The expenses incurred by the writer were minimal.

The materials required for the writer's program came from supplies already available in the classroom or through county funds. Resource materials in terms of selected enrichment programs to increase the daily experience of the students in terms of analysis were drawn from the writer's collection of gifted and special materials already purchased for the Academic Excellence curriculum.

METHOD

The writer implemented a ten week program using an eclectic approach to improve the higher cognitive skill of analysis in a target population of five fifth grade and five sixth grade Academic Excellence students as selected by test scores on the Ross Test of Higher Cognitive Skills in correlation with the "Math Applications" scores on the "Stanford Achievement Test. Since the Ross Test had previously been administered, the basis for final correlation had already been established and no time was needed during the ten week implementation for this step.

It was necessary to adjust the size of the original target group as it was lowered by two students, one fifth grader and one sixth grader, who transferred to other schools during the third and fourth weeks of the program. The writer continued on with the remaining eight target students as well as the rest of the class.

The implementation period focused on three types of activities. In terms of time, the activities were either daily or weekly, with the inclusion of one major individual research project which involved three weeks.

Each day the writer spent fifteen to twenty minutes in language arts or mathematics on tasks specifically geared to increase analytical skills. Approximately fifteen minutes daily was spent at home by the students, on an assignment related to the program.

Daily tasks at school were drawn from Classroom Quickies, Books 1,2,3. These books provide various kinds of problems for students to solve using either mathematics or language as a basis. The

problems were presented as part of a daily lesson, written on the board, analyzed together and solved. In the latter weeks of the implementation period (weeks six through eight) every other problem was solved individually, not as a group.

This part of the program was enthusiastically received by the students. They would clamor for extra "Quickies" whenever they had a few moments of time. They even asked for problems to solve during lunch time or for homework!

The daily task at home was a sheet of four activities sent home each Monday. These activities were drawn from Word Ways, Book B. One word activity was done for homework each night. Each Friday, students brought the sheet to school so that the total group participated in a self-checking exercise and class discussion.

Many students enjoyed these step-by-step activities so much that they completed the entire worksheet in one evening. During the Friday discussion session, analysis of the analogous or non-analogous relationships in the various directions of the activities was the primary emphasis. Individual students participated by going to the board to read a direction/step and put up his/her answer. Since most activities had seven or eight steps, with the weekly four activities required, each student participated at least once.

For the written homework exercises, the writer used ongoing charting. After the Friday self-checking session students recorded a + or - on a "Personal Activity Checklist" indicating whether they successfully completed the exercise (see Appendix F). These were tabulated at the end of week ten

On a weekly basis, the writer had one language arts lesson, one mathematics lesson, and social studies lesson which took twenty to fifty minutes to accomplish. These were incorporated into the regular schedule, but were spaced throughout the week for maximum continued effect and to coordinate with the daily tasks.

The weekly language arts lesson was an extrapolation on the creative thinking skills used in the Think Tank game. These lessons lasted thirty to forty-five minutes based on student interest and participation. These simulation games all had a basic idea from which to begin. Students used these as a "jumping-off" point for analysis and solution. Most of the lessons were done on an individual basis, although during two sessions, students were paired to "brainstorm". The period for listing solutions was timed, usually a five to ten minute block. Students were then randomly selected to read one or two of their answers. If others had the same answer they were to line them out until only those with the most unusual solutions remained.

The writer's anecdotal records note that the students were initially overwhelmed by expectations such as: "List twenty things that are invisible". Further notations show greater creativity, freedom of thought, and less fear resulting in the ability to effectively complete a request to answer: "What are all of the effects of not keeping peace? List at least twenty ideas." Due to the nature of these lessons no formal scoring was done, only anecdotal records were kept.

In mathematics, What's My Rule: Using Problem Solving Strategies, Grades 6-12 was the activity key. A group analysis of a

math rule was done with a follow-up worksheet to be completed individually. The lesson was twenty to thirty minutes with a worksheet from which to deduce the rule handed out to everyone. A timed five minute period was given to find the rule and apply it to four problems. At the end of the five minute period, the rule (i.e. n+13, n-25, 250-n) was revealed and the problems self-checked. Students were awarded at least one point for attempting the activity even if they did not successfully deduce the rule or complete the problems. The students then recorded their scores in the appropriate column of the "Lesson Evaluation" (Appendix G).

The "What's My Rule" activities were very popular and as they became more difficult certain students evidenced great proficiency while others were unable to find the rule without one-to-one guidance by their peers or the writer.

S.O.A.R.: A Program for the Gifted Using Bloom's Taxonomy provided a weekly social studies exercise. The student workbook, from which selected exercises were used, was based on the theme. "There were Different Modes of Adaptation to Different Environments". Each week the students investigated one of the multi-dimensional lessons. They analyzed the picture, answered the questions and projected solutions as necessary. The S.O.A.R. lesson was presented with directions each Monday, and per teacher judgment was due either Thursday or Friday of the same week. These lessons were scored by the writer on a basis of creativity and thoroughness as well as accuracy.

Without a doubt, these lessons were the most difficult phase of the program. On the students' behalf, the lessons were abstract and

demanding. They required analysis, creativity and perseverance to complete. A number of the lessons were artistically oriented or architecturally oriented while a few focused on language development or the weather.

The students who completed all the lessons were often required in the final step to evaluate the value of the lesson. Many found them challenging but worthwhile, while some were baffled.

On the writer's behalf, these lessons were very time-consuming to evaluate and score. On a zero to five basis, most students received a three. There were only occasional fours and fives.

The writer also found the record-keeping difficult as not all students maintained a weekly ritual of handing in the lessons. Absences, lack of motivation, and confusion were indicated by some students only sporadically completing the work.

Nine lessons were issued to the students during the ten week period of implementation, and overview of how the lessons were to be completed.

It became evident that some students were not sufficiently moved to do a weekly lesson, so the writer presented the lessons to everyone with encouragement, but did not chastise those who did not, or would not, fulfill the written requirements. Those lessons which were not completed were simply recorded as zero.

The writer believes that perhaps with more direction these lessons might have been accepted and completed. The writer also notes that since the S.O.A.R. program does concentrate on Bloom's Taxonomy, perhaps as an initial introduction to those skills, the S.O.A.R. material may have been a less than satisfactory choice. It

is a program for the gifted and since the target group was academic excellence, not gifted, it may not have been suitable.

Weekly records of the "What's My Rule" worksheet and the "SOAR" lesson were recorded in terms of a numerical scale of zero to five with five being the high for a lesson done thoughtfully and analytically. The writer determined that this scale would allow for credit for all attempts made even if the outcome was not totally accurate (see Appendix G).

The last phase of the program was an individual research project that was conducted at home by the students over a three week period beginning in the fifth week of implementation. This project was based on an idea from PEGASUS: Providing Enrichment for the Gifted Adapting Selected Units of Study. The "PEGASUS" program had units for each level of Bloom's Taxonomy and the writer adapted a unit on the critical thinking skill of analysis through the examination of advertising.

The students chose a common product and did a comparison of television, radio, and magazine advertising. He/she differentiated between what a consumer observes and what a consumer infers, providing examples. He/she looked for the fine line between cleverness and deception in advertising. This major project included both language arts and social studies concepts aligned with the popularity of the media. Since all the students were in contact with the media, they maintained an ongoing analysis of their chosen subject product. A two to three page report of the student's conclusions was required during the eighth week of the implementation period.

Students selected a broad spectrum of topics and generally seemed to enjoy the project. The research papers were scored by the writer. The writer did not correct grammar or spelling, but evaluated solely on the basis of the analysis of the media observations. The research project was scored on a basis of fifteen points since it was a three week project. The criteria of concentration, effectiveness, and analysis were used. The students read their papers aloud to their classmates and a general critique was allowed. The predominate range of scores was nine, ten and eleven, although 20 to 25 percent of the class received thirteens, and one student received a fourteen. No paper was awarded a score of fifteen.

This lengthy phase was completed by all students except one of the target sixth graders. Most students followed the guidelines closely and only had difficulty when they tended to interject their personal opinions rather than offer objective information.

Record keeping techniques worked well. The writer was pleased with the use of the anecdotal records as the spontaneity and flexibility flowed along well with the program and the writer's personality.

Weekly evaluation of the "What's My Rule" and "S.O.A.R." scores was easily accomplished as the writer found that during the recording of scores, it was possible to move about the classroom glancing at each student's "Lesson Evaluation Form."

The writer was able to see the students' "Personal Activity Checklists" while checking the sentences following each activity in "Word Ways".

All material was maintained in a separate individual student folder with the "Personal Activity Checklist" and the "Lesson Evaluation Form" stapled inside for easy access and recording.

The last method the writer used to monitor progress was a re-administration of the entire Ross Test of Higher Cognitive Skills. This served as a final evaluation of the program (see Appendix H).

RESULTS

The intended goal of this practicum was to increase the higher cognitive skill of analysis in a target group of fifth and sixth grade Academic Excellence students. The major goal was to be the demonstration of improved scores on the Ross Test of Higher Cognitive Skills during the spring testing as compared to the fall testing.

The first objective stated that after the implementation period, those targeted students who had scored below the 30th percentile, a deficient score, would, on re-administration of the testing instrument, achieve a non-deficient score. This objective was completely successful as all students scored above the 30th percentile on retesting (see Appendix I).

The second objective stated that after the implementation period, those targeted students who scored between the 31st and 50th percentiles would achieve a score ten percentile points higher on retesting. Of the students retested, one successfully achieved this objective and one did not. The writer notes that the successful student was twelve percentile points above but the unsuccessful student lost points (see Appendix J).

The third objective stated that after the implementation period, those targeted students who scored between the 51st and 75th percentiles would achieve a score five percentile points higher on retesting. Of the students retested, two successfully achieved this objective, and two did not. The writer observes that the two successful students raised their scores on Section III (See Appendices I and J) while the others lost points on Section VII. This

circumstance is a repetition of the results of the second objective wherein the successful student achieved his goal on Section III and the unsuccessful student was foiled by Section VII.

It is the writer's contention that, overall, the practicum was very beneficial to the students as demonstrated by the complete non-deficiency of scores. Those students who achieved the first objective improved from 20 to 93 percentile points on re-administration. The writer feels this is indeed notable.

The results of objectives two and three were both 50% successful. As is noted above, the successes were all on Section III. It appears that a program modification might be necessary to raise the retest percentiles of Section VII. As indicated by the scores on each section (see Appendix I) only one student lost points on Section III, whereas four students lost points on Section VIII. Percentile points were raised between 5 and 79 points on Section III, and 20 and 93 points on Section VII. However, students lost between 8 and 28 points on Section VII as well.

The fourth objective stated that students would demonstrate a more analytical problem-solving approach to their work as measured by teacher observation.

Although the teacher's observations of the students overall enthusiasm to the program was a sufficient response to satisfy the writer, the results of the "Personal Activity Checklist" and "Lesson Evaluation Forms" of the targeted group (see Appendix K) further justify the writer's belief that objective four was definitely met. The statistical results of the lesson scores, even with student P.L. having numerous absences which lowered his production, are certainly above

the average. Especially the "What's My Rule" overall average of 4.44 of a possible 5 is excellent.

The writer pointed out in the previous section that the unscored activities were among the most popular. The requests for extra "Classroom Quickies" would suggest a desire on the students' part for more analytical tasks. The writer also notes that upon completion of the practicum, the students requested continuation of all of the activities, including the difficult S.O.A.R. lessons, for the balance of the school year.

It is believed by the writer that the program was by all standards highly successful. The negative aspects of time-consuming evaluations on the S.O.A.R. activities, and the students' occasional frustration with those activities as well, should be concerns to be addressed when this program is used again.

RECOMMENDATIONS

An eclectic approach to the improvement of the skill of analysis, as indicated by this study, has validity, and allows for widespread implementation. Any target population can be introduced to some or all of the lesson techniques of this program. Modification can be made to fit most grade and/or achievement levels. The ease of introduction of lessons on a weekly basis, along with the simplified record keeping, and the use of a variety of lesson sources, would enhance any classroom.

As previously mentioned all objectives of the practicum were feasible, objectives one and four being especially effective. Program modification would be necessary for objectives two and three to become more highly effective.

This project and its goals would benefit from introduction earlier in the school year and by a longer implementation period. Gains should be increased by this elongated time frame.

The practicum setting was a classroom of 30+ students and, with the exception of the S.O.A.R. activities, was handled comfortably. Modifications for lower elementary grades would be necessitated by the students' inability to record his/her own scores. The classroom teacher would need to have an aide or student assistant to record the scores, or would need to work on one set of lesson components at a time.

Although the target group of this study was initially only one-third of the class, lowering to one-fourth of the class, the entire

class participated in the program. Therefore, the writer feels that any class might be a setting for this study.

In-service training at each grade level would be helpful to acquaint educational professionals with this eclectic approach to teaching analysis. Professionals could use the record-keeping format and adjust their material sources as they saw fit.

It is the writer's intention to continue with this program in the summer school setting and into next year. Projected modifications should alleviate the time-consuming evaluative technique used during this study.

The writer has ordered and received more materials on higher order thinking which will be incorporated into the program. The possibility of setting up a center in the classroom devoted to thinking skills is being investigated, since the students could then move at their own pace without the restraints of their fellow students.

The writer further proposes to share the entire program with the writer's colleague who has responsibility for the combination third and fourth grade Academic Excellence class. It is hoped that this will establish a continuum between the classes.

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